DERWENT-ACC-NO: 2004-012346

DERWENT-WEEK: 200442

TITLE: Digital controller for electric motors, has microcontroller programmed to control operations of controller, and transient and surge protection circuit to suppress voltage spikes and unexpected current surges

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PATENT-FAMILY:

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ABSTRACTED-PUB-NO: WO2003096523A

BASIC-ABSTRACT:

NOVELTY - The **controller** has a microcontroller (80) programmed to control
operations of the apparatus. Voltage and current zero cross **detectors** (50, 98)
are provided to detect AC supply voltage and zero crossings of load current. A
transient and **surge protection** circuit (4) suppresses voltage spikes and
unexpected current surges. An over current **detector** (30) coupled in series
with a load senses the current flowing through the load.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) a method of reducing the energy consumption of single-phase AC induction
motors

(b) a method of switching off the electrical load

(c) a method of controlling the sudden inrush of current to the motor load

(d) a method of delaying the application of power to the load

(e) a method of allowing operation from 110 volts to 230 volts AC.

USE - Used for controlling energy consumption of low power single- phase AC
motors and for conditioning power of household appliances.

ADVANTAGE - The microcontroller chip is a single low cost device that
automatically adjusts the voltage applied to the motor based on a power factor
or a phase angle between a voltage and a current, thereby saving the energy
consumption. The controller performs power-on delay functions so as to prevent
damage to the load during power interruptions, and auto-voltage operations to
allow operations over a wide range of voltages. The transient and surge
protection circuit suppresses the voltage spikes and the unexpected surges in
the current, thereby protecting the load.

DESCRIPTION OF DRAWING(S) - The drawing shows a block diagram of the digital
controller apparatus.

Transient and surge protection circuit 4

Over current detector 30

Load 46

Voltage zero cross detector 50

Microcontroller 80

Current zero cross detector 98

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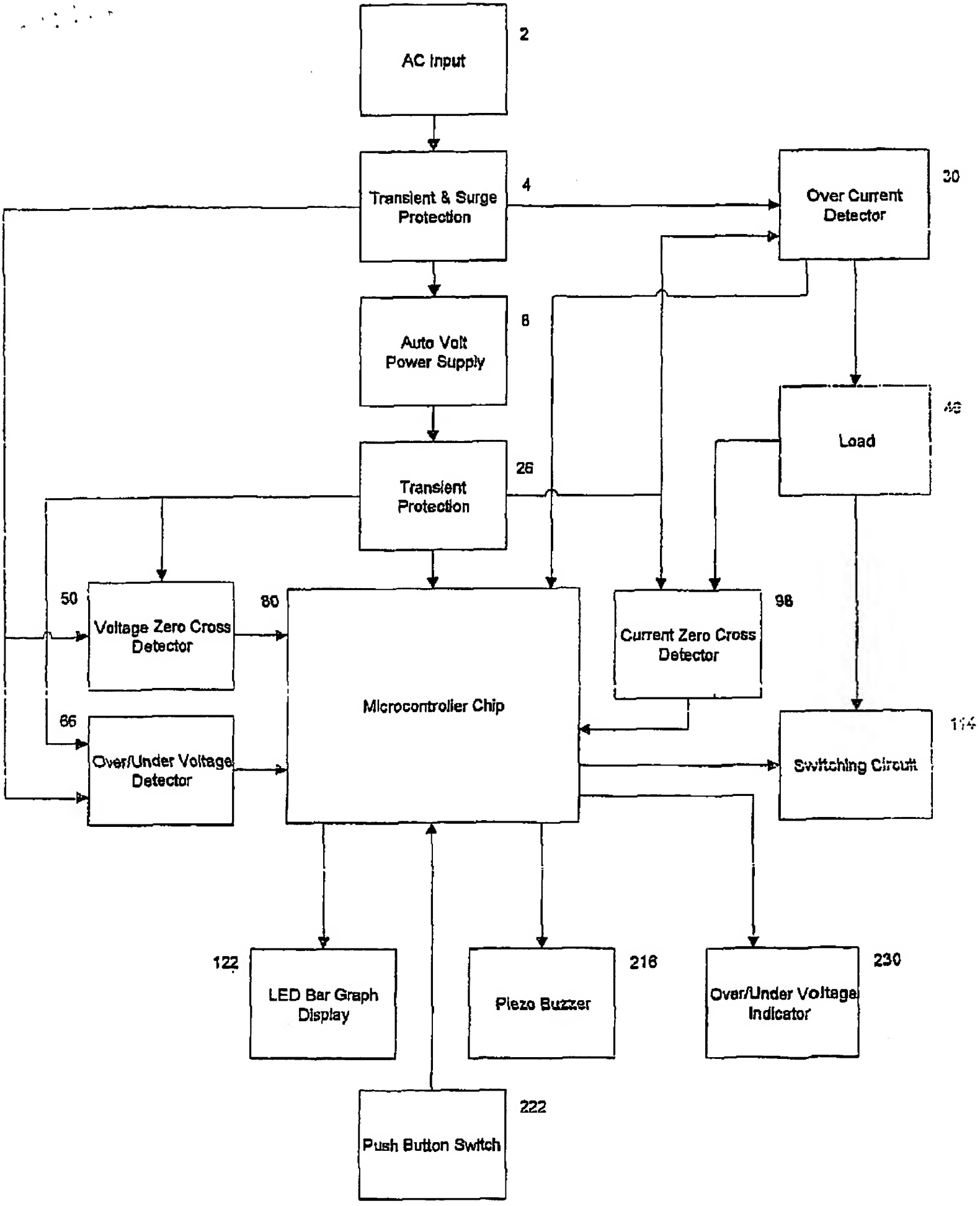
AC Input
2
Transient & Surge Protection
4
Over Current Detector
30
Auto Volt Power Supply
6
Load
Transient Protection
26
50
Voltage Zero Cross Detector
60
Microcontroller Chip
Current Zero Cross Detector
98
66
Over/Under Voltage Detector
Switching Circuit
114
122
LED Bar Graph Display
Piezo Buzzer
216
Over/Under Voltage Indicator
230
Push Button Switch
222